

Installation, Operation and RENEWAL PARTS IDENTIFICATION

SERVICE REFERENCE

DIVISION 4	SECTION CVEP
SALES REFERENCE (Supersedes PF457-7)	PF457-8
	161-302639-001
DATE	JUNE, 2010

Type CVEP-C Convection Air Heater for Hazardous Locations



NOTICE: Carefully remove heater from carton and check for shipping damage. Any damage claims should be entered immediately with the carrier.

GENERAL

Type CVEP Convection Heaters are designed for use in Class I, Div I hazardous environments. Units without control options are suitable for areas classified as Groups B, C & D. Units with built-in controls can be supplied for groups C and D or B, C and D. Refer to classification stamped on heater nameplate.

! WARNING

FIRE/EXPLOSION HAZARD. *To prevent ignition of hazardous atmospheres, this heater should not be installed in areas where vapors or gases having an ignition temperature less than 280°C (536°F)(T2A) at 1.8kW, 3.6kW, 4.5kW, 7.6kW, 9.0kW or 180°C (356°F)(T3A) at 1.6kW, 3.2kW, 4.0kW are present.*

These heaters must not be operated in ambient temperatures exceeding 40°C (104°F).

1. Connect air heaters to the same line voltage as on heater nameplate.
2. Heaters can be mounted individually end to end.
3. Heaters can be mounted directly on any type of surface masonry, concrete, block, plastered walls, metal framework, etc.-using appropriate hardware.
4. All controls such as thermostat and contactor, when required must

have the same explosion-proof rating as heater.

5. Do not install one unit above the other.
6. Units are mounted a minimum of 8" above the floor.
7. Heaters are mounted on wall in a horizontal position with terminal end at right. **Never** recess heater into wall.
8. **NOTE:** Article 500 of the National Electric Code (NEC) outlines requirements for installation of electrical equipment in hazardous (Classified) locations.
9. All unit electrical installation fittings, conduit, wiring and seals must meet NEC and local codes for hazardous locations. External line fusing or circuit breaker protection is required.
10. Failure to understand and follow these installation instructions and the "WARNING" notes contained therein may result in severe personal injury, death or substantial property damage.

! WARNING

ELECTRIC SHOCK HAZARD. *Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.*

INSTALLATION

! WARNING

ELECTRIC SHOCK HAZARD. *Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage. Heater must be installed by a qualified person in accordance with the National Electrical Code, NFPA 70.*

1. Remove front panel by removing screws.
2. Locate desired heater position on wall.
3. Locate mounting holes for rear panel. Rear panel must be a minimum of 8" from the floor.
4. Refer to Figure 1A, 1B or 1C for mounting hole layout for each cabinet size.

5. Drill a pilot hole in wall mounting surface at each mounting hole location. Use a convenient small size drill.
6. Drill the mounting holes in accordance with size in Table 1. Insert anchors where applicable.
7. Fasten rear panel to wall with screws noted in Table 1.
8. Replace front panel and screws.

! WARNING

FIRE HAZARD. *Never operate heater with front panel off. Adequate air flow across heating elements requires the front panel to be in place. The heating elements could overheat causing equipment damage or personal injury.*

INSTALLATION

CVEP MODELS WITHOUT CONTROLS — GROUPS B, C AND D

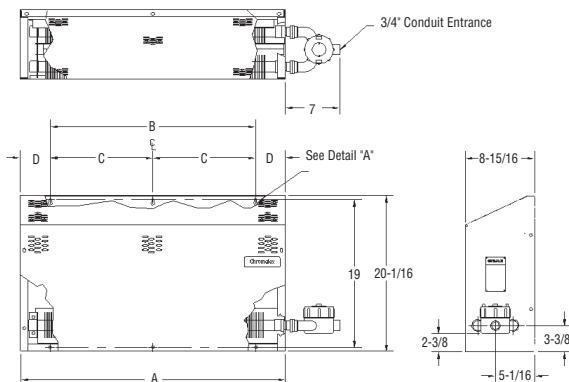


Figure 1A

Dimensions (In.)

kW	A	B	C	D
1.6				
1.8	34	20	10	7
3.6				
3.2	58	32	16	13
7.6				
4.0	70	48	24	11
4.5				
9.0				

CVEP MODELS WITH BUILT-IN CONTROLS — GROUPS B, C AND D

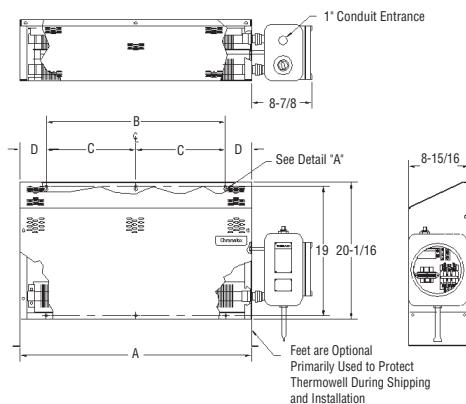


Figure 1B

Dimensions (In.)

kW	A	B	C	D
1.6				
1.8	34	20	10	7
3.6				
3.2	58	32	16	13
7.6				
4.0	70	48	24	11
4.5				
9.0				

CVEP MODELS WITH THERMOSTAT ONLY — GROUPS C AND D

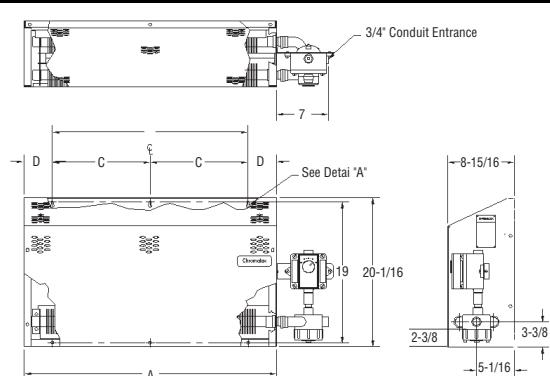


Figure 1C

Dimensions (In.)

kW	A	B	C	D
1.6				
1.8	34	20	10	7
3.6				
3.2	58	32	16	13
7.6				
4.0	70	48	24	11
4.5				
9.0				

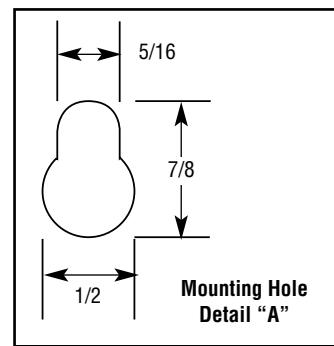
Table 1 — Suggested Heater Mounting Screws — Types and Sizes

Type of Mounting Surface	** Accessory Hardware	Screw Type	Drill Size and Type	Screw Size to Fit Mtg Hole Size
Concrete Block Masonry	Ackerman	Rd. Hd. Mach. Steel	1/2" Masonry	† 1/4" x 20 x.....lg
	Lead Anchor	Rd. Hd. Mach Steel or Pan Hd. Metal (Self Tapping)	5/16" Masonry	† # 1/4" xlg
Wood Studs	— —	Wood or Metal (Self Tapping)	— —	† # 1/4" xlg
Plaster wall Hollow or Similar Type	— —	Toggle Bolt	#7 Twist	† # 1/4" xlg
* Metal Beam, Channel, etc.	Nuts Washers	Rd. Hd. Mach. Steel	#7 Twist	† 1/4" x 20 x.....lg

*If clearance permits use washer, lockwasher and nut; otherwise drill and tap to these lengths add thickness of beam, washers, nut, etc.

**If mounting structure permits. Except plastered hollow walls explosive type anchors can be used. Suggested size noted in Table and/or sketches to be used to determine size of anchors.

†Select overall length of screw to provide a minimum penetration of 1 inch into base wall material.



WIRING

⚠ WARNING

ELECTRIC SHOCK HAZARD. Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

1. All wiring should be done in accordance with local codes and the National Electrical Code by a qualified person as defined in the NEC.
- CAUTION: Use copper conductors only.**
2. Rough-in-line-wiring to unit in manner approved for hazardous locations. (See warning below.)
3. Wire per diagrams 1 through 6 based on the rating and control options listed in table 2. Refer to table 3 for amperage specifications.

4. Remove cover of conduit box for connections. Use either opening and plug the other with the plug provided.
5. In single phase units the heaters must be wired in parallel, combining L1 to L1, L2 to L2 and for 3 phase unit, L3 to L3.
6. Re-assemble cover with a minimum of 7 turns.

⚠ WARNING

FIRE/EXPLOSION HAZARD.(Group B atmospheres)
To prevent ignition of Group B atmospheres, conduit runs must not exceed 3/4" in size and all conduit runs 1/2" size and larger must have a sealing fitting connected within 2", 6" or 18" of the terminal enclosure depending on the exact model. For correct placement, refer to data located on the enclosure label.

Single Phase — No Controls, 120-277V & Heater Amps < 22A

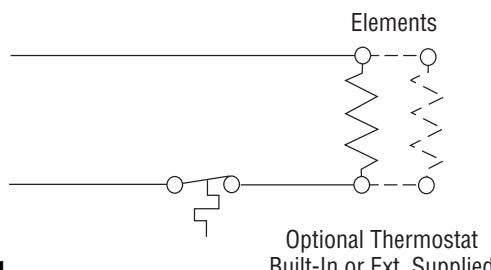


Diagram 1

Single Phase — No Controls, Volts > 277V & 120-277V When Heater Amps > 22A

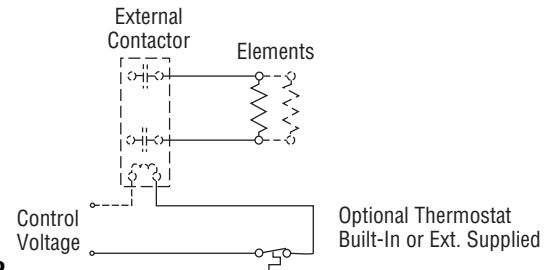


Diagram 2

Three Phase – No Controls

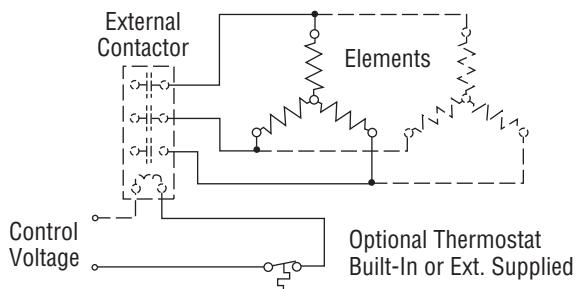


Diagram 3

Single or Three Phase With Controls — Contactor & Transformer

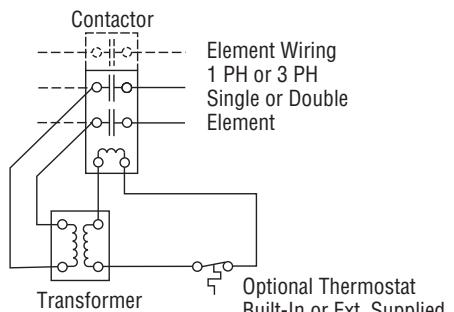


Diagram 4

Single or Three Phase With Controls — Contactor & Line Voltage Control

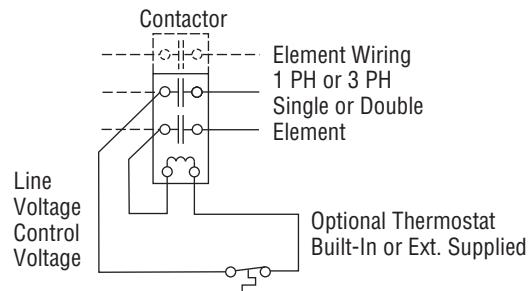


Diagram 5

Single or Three Phase With Controls — Contactor & External Supplied Control Voltage

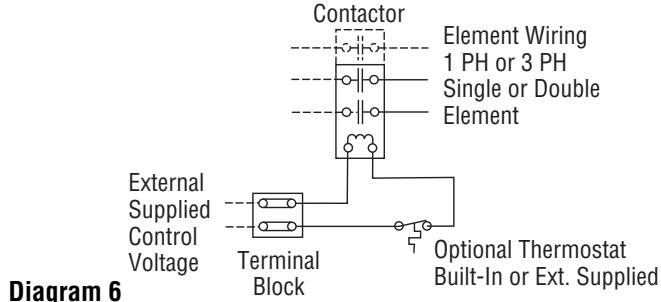


Diagram 6

OPERATION

⚠ CAUTION

The system designer is responsible for the safety of this equipment and should install adequate back-up controls and safety devices with their electric heating equipment. Where the consequences of failure could result in personal injury or

property damage, back-up controls are essential.

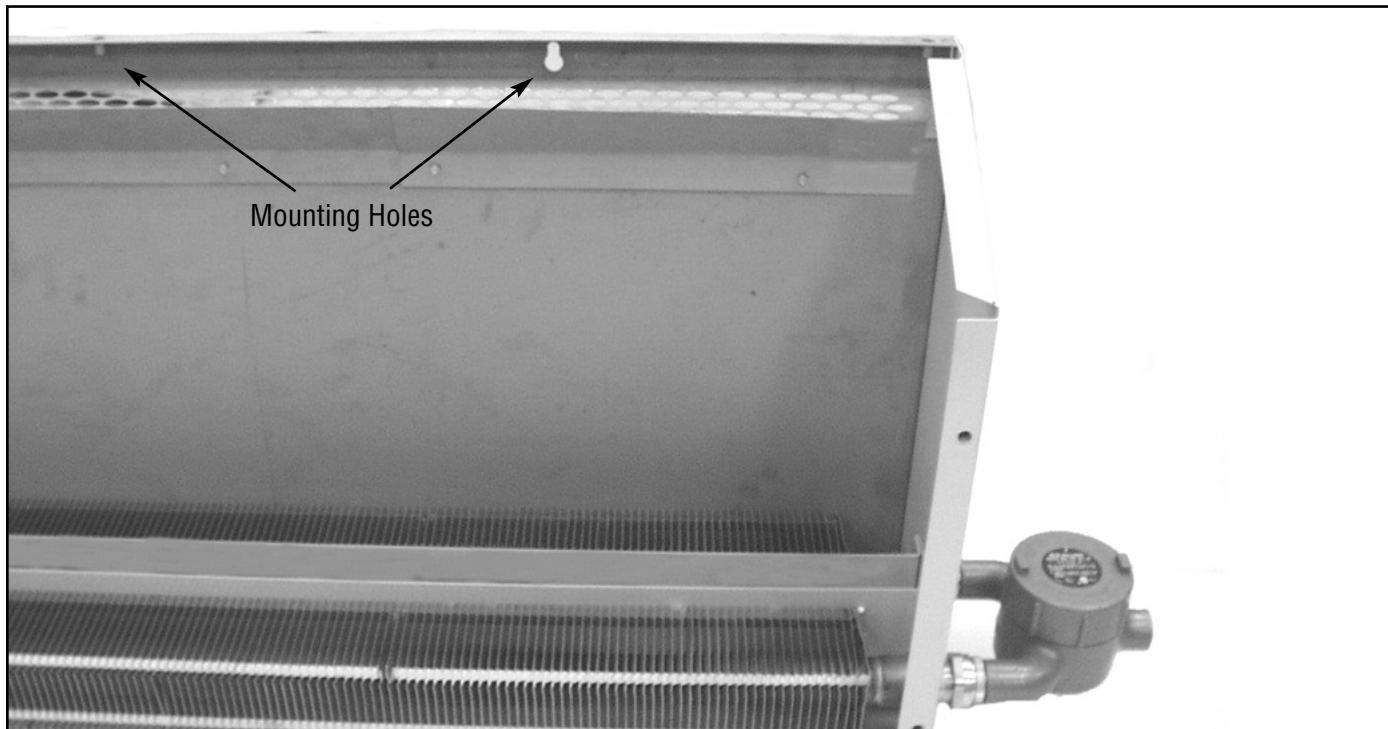
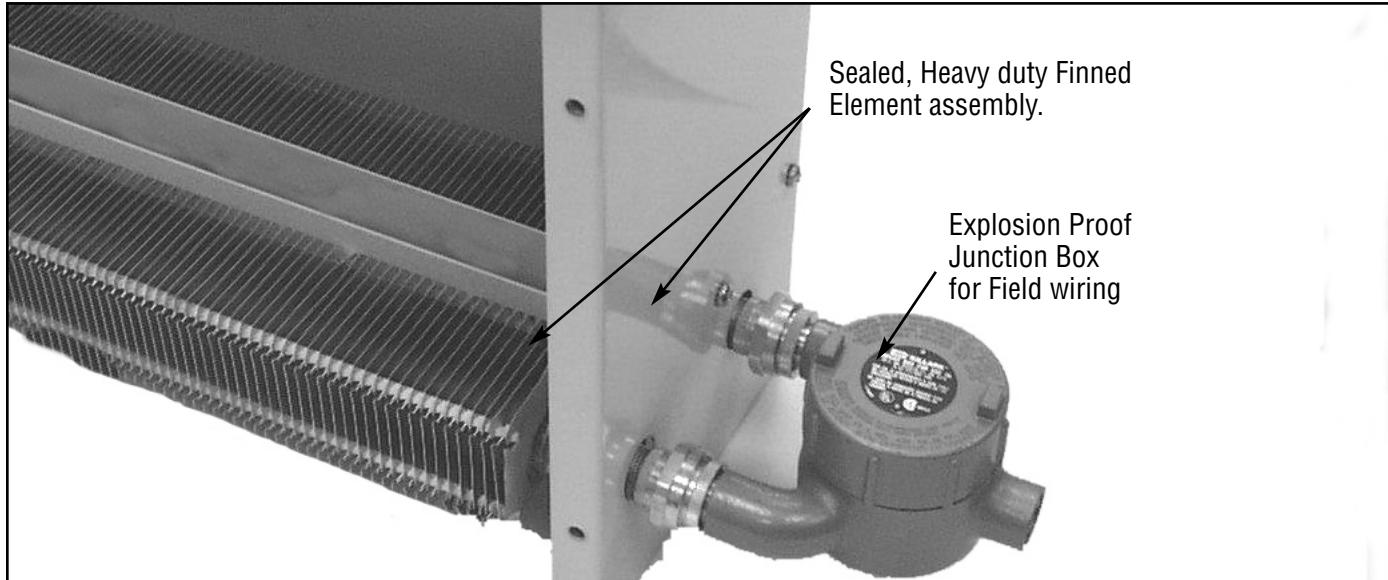
1. Do not operate heater at voltages in excess of that stamped on the heater since excess voltage will shorten heater life and cause high element temperatures which may exceed allowable temperatures of operation in a hazardous atmosphere.

MAINTENANCE

! WARNING

ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage. Heater must be installed by a qualified person in accordance with the National Electrical Code, NFPA 70.

1. Before activating for next heating season, vacuum or use compressed air to remove accumulated dust or lint, which otherwise may restrict proper air flow.
2. Periodically check all electrical connections and retighten to avoid electrical wiring difficulties.
3. Check to ensure terminal cover is tightly closed, before energizing.



ELEMENT REPLACEMENT

! WARNING

ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage.

1. Disconnect power from circuit.
2. Remove cover from junction box and disconnect element wiring.

3. Remove front panel by removing screws.
4. Loosen aluminum coupling connecting element to junction box.
5. Remove screws and bracket holding element end opposite junction box.
6. Disconnect aluminum coupling connection element to junction box.
7. Remove element from cabinet.
8. Install element in reverse sequence.

RENEWAL PARTS IDENTIFICATION

MANUFACTURER MODEL NUMBER BREAKDOWN (located on unit nameplate)

Model

CVEP

Explosion Proof Convection Heater

CVEP-C	<u>Temperature Rating</u>					
	Code	kW	ID Number	°F	°C	(BTU)
	16	1.6	T3A	356	180	5,500
	18	1.8	T2A	536	280	6,150
	32	3.2	T3A	356	180	11,000
	36	3.6	T2A	536	280	12,300
	40	4.0	T3A	356	180	13,600
	45	4.5	T2A	536	280	15,350
	76	7.6	T2A	536	280	25,930
	90	9.0	T2A	536	280	30,700
	Code	Voltage	<u>Maximum kW Allowable</u>			
			1	120	1.8	
			2	240	9.0	
			3	380	9.0	
			4	480	9.0	
			5	415	9.0	
			6	575	9.0	
			7	277	9.0	
			8	208	9.0	
			9	600	9.0	
	Code	<u>Phase</u>				
		1	1Ø			
		3	3Ø (Not available in 120, 277V)			
	Code	<u>Control Combination</u>				
		Contactor Coil	Transformer Secondary			
			00	None	None	
			30	24 Volt	24 Volt	
			31	24 Volt	None	
			32	120 Volt	120 Volt	
			33	120 Volt	None	
			34	208/240 Volt	None	
			35	277 Volt	None	
	Code	<u>Temperature Control</u>				
		00	None			
		40	Thermostat 40 - 90°F			
		42	Group B, C & D			
			Thermostat Group C & D			
			50 - 90°F			
CVEP-C	36	2	1	30	42	

TABLE 2 — TEMPERATURE SPECIFICATIONS
DIMENSIONS REPLACEMENTS ELEMENTS REQUIREMENTS

Temperature Rating T3A 356°F (180°C)

Common To Units W & W/O Suffix B

kW	BTU	Volts	Phase	Amps	Model	Width A	Height B	Depth C	Wt. (Lbs.)	Element P/N	Qty.
1.6	5,500	208	1	7.7	CVEP-C-16-81	34"	20-1/16"	8-15/16"	58	003-304650-002	2
1.6	5,500	208	3	4.4	CVEP-C-16-83	34"	20-1/16"	8-15/16"	58	003-304650-005	2
1.6	5,500	240	1	6.7	CVEP-C-16-21	34"	20-1/16"	8-15/16"	58	003-304650-096	2
1.6	5,500	240	3	3.8	CVEP-C-16-23	34"	20-1/16"	8-15/16"	58	003-304650-006	2
1.6	5,500	277	1	5.8	CVEP-C-16-71	34"	20-1/16"	8-15/16"	58	003-304650-004	2
1.6	5,500	480	1	3.3	CVEP-C-16-41	34"	20-1/16"	8-15/16"	58	003-304650-091	2
1.6	5,500	480	3	1.9	CVEP-C-16-43	34"	20-1/16"	8-15/16"	58	003-304650-009	2
1.6	5,500	575	3	1.6	CVEP-C-16-63	34"	20-1/16"	8-15/16"	58	003-304650-010	2
3.2	11,000	208	1	15.4	CVEP-C-32-81	58"	20-1/16"	8-15/16"	94	003-304650-023	2
3.2	11,000	208	3	8.9	CVEP-C-32-83	58"	20-1/16"	8-15/16"	94	003-304650-026	2
3.2	11,000	240	1	13.3	CVEP-C-32-21	58"	20-1/16"	8-15/16"	94	003-304650-097	2
3.2	11,000	240	3	7.7	CVEP-C-32-23	58"	20-1/16"	8-15/16"	94	003-304650-027	2
3.2	11,000	277	1	11.6	CVEP-C-32-71	58"	20-1/16"	8-15/16"	94	003-304650-025	2
3.2	11,000	480	1	6.7	CVEP-C-32-41	58"	20-1/16"	8-15/16"	94	003-304650-093	2
3.2	11,000	480	3	3.8	CVEP-C-32-43	58"	20-1/16"	8-15/16"	94	003-304650-030	2
3.2	11,000	575	3	3.2	CVEP-C-32-63	58"	20-1/16"	8-15/16"	94	003-304650-031	2
4.0	13,600	208	1	19.2	CVEP-C-40-81	70"	20-1/16"	8-15/16"	112	003-304650-045	2
4.0	13,600	208	3	11.1	CVEP-C-40-83	70"	20-1/16"	8-15/16"	112	003-304650-048	2
4.0	13,600	240	1	16.7	CVEP-C-40-21	70"	20-1/16"	8-15/16"	112	003-304650-046	2
4.0	13,600	240	3	9.6	CVEP-C-40-23	70"	20-1/16"	8-15/16"	112	003-304650-049	2
4.0	13,600	277	1	14.4	CVEP-C-40-71	70"	20-1/16"	8-15/16"	112	003-304650-047	2
4.0	13,600	480	1	8.3	CVEP-C-40-41	70"	20-1/16"	8-15/16"	112	003-304650-094	2
4.0	13,600	480	3	4.8	CVEP-C-40-43	70"	20-1/16"	8-15/16"	112	003-304650-052	2
4.0	13,600	575	3	7.0	CVEP-C-40-63	70"	20-1/16"	8-15/16"	112	003-304650-053	2

Temperature Rating T2A 536°F (280°C)

kW	BTU	Volts	Phase	Amps	Model	Width A	Height B	Depth C	Wt. (Lbs.)	Element P/N	Qty.
1.8/3.6	6,150/12,300	208	1	8.7/17.3	CVEP-C-18/36-81	34"	20-1/16"	8-15/16"	46/58	003-304650-034	1 or 2
1.8/3.6	6,150/12,300	208	3	5.0/10.0	CVEP-C-18/36-83	34"	20-1/16"	8-15/16"	46/58	003-304650-038	1 or 2
1.8/3.6	6,150/12,300	240	1	7.5/15.0	CVEP-C-18/36-21	34"	20-1/16"	8-15/16"	46/58	003-304650-098	1 or 2
1.8/3.6	6,150/12,300	240	3	4.3/8.7	CVEP-C-18/36-23	34"	20-1/16"	8-15/16"	46/58	003-304650-039	1 or 2
1.8/3.6	6,150/12,300	277	1	6.5/13.0	CVEP-C-18/36-71	34"	20-1/16"	8-15/16"	46/58	003-304650-036	1 or 2
1.8/3.6	6,150/12,300	480	1	3.8/7.5	CVEP-C-18/36-41	34"	20-1/16"	8-15/16"	46/58	003-304650-037	1 or 2
1.8/3.6	6,150/12,300	480	3	2.2/4.3	CVEP-C-18/36-43	34"	20-1/16"	8-15/16"	46/58	003-304650-042	1 or 2
1.8/3.6	6,150/12,300	575	3	1.8/3.6	CVEP-C-18/36-63	34"	20-1/16"	8-15/16"	46/58	003-304650-043	1 or 2
7.6	25,930	208	1	36.5	CVEP-C-76-81	58"	20-1/16"	8-15/16"	94	003-304650-055	2
7.6	25,930	208	3	21.1	CVEP-C-76-83	58"	20-1/16"	8-15/16"	94	003-304650-058	2
7.6	25,930	240	1	31.7	CVEP-C-76-21	58"	20-1/16"	8-15/16"	94	003-304650-099	2
7.6	25,930	240	3	18.3	CVEP-C-76-23	58"	20-1/16"	8-15/16"	94	003-304650-059	2
7.6	25,930	277	1	27.4	CVEP-C-76-71	58"	20-1/16"	8-15/16"	94	003-304650-057	2
7.6	25,930	480	1	15.8	CVEP-C-76-41	58"	20-1/16"	8-15/16"	94	003-304650-095	2
7.6	25,930	480	3	9.1	CVEP-C-76-43	58"	20-1/16"	8-15/16"	94	003-304650-062	2
7.6	25,930	575	3	7.6	CVEP-C-76-63	58"	20-1/16"	8-15/16"	94	003-304650-063	2
4.5/9.0	15,350/30,700	208	1	21.6/43.3	CVEP-C-45/90-81	70"	20-1/16"	8-15/16"	87/112	003-304650-065	1 or 2
4.5/9.0	15,350/30,700	208	3	12.5/25.0	CVEP-C-45/90-83	70"	20-1/16"	8-15/16"	87/112	003-304650-069	1 or 2
4.5/9.0	15,350/30,700	240	1	18.8/37.5	CVEP-C-45/90-21	70"	20-1/16"	8-15/16"	87/112	003-304650-100	1 or 2
4.5/9.0	15,350/30,700	240	3	10.8/21.7	CVEP-C-45/90-23	70"	20-1/16"	8-15/16"	87/112	003-304650-070	1 or 2
4.5/9.0	15,350/30,700	277	1	16.2/32.5	CVEP-C-45/90-71	70"	20-1/16"	8-15/16"	87/112	003-304650-067	1 or 2
4.5/9.0	15,350/30,700	480	1	9.4/18.8	CVEP-C-45/90-41	70"	20-1/16"	8-15/16"	87/112	003-304650-068	1 or 2
4.5/9.0	15,350/30,700	480	3	5.4/10.8	CVEP-C-45/90-43	70"	20-1/16"	8-15/16"	87/112	003-304650-073	1 or 2
4.5/9.0	15,350/30,700	575	3	4.5/9.0	CVEP-C-45/90-63	70"	20-1/16"	8-15/16"	87/112	003-304650-074	1 or 2

REPLACEMENT PARTS

Model Any Voltage	Front Cover Assembly	Rear Cover Assembly	Right Side Panel	Left Side Panel	Element Support Bracket
CVEP-C-16/18/36	207-304644-101	207-304644-001	207-304644-201	304-304644-301	027-304646-001
CVEP-C-32/76	207-304644-102	207-304644-002	207-304644-201	304-304644-301	027-304646-001
CVEP-C-40/45/90	207-304644-103	207-304644-003	207-304644-201	304-304644-301	027-304646-001

* Included when unit is equipped with control(s).

C V E P - C - kW - Volts Phase - Control - Stat

Code	Control Combination	
	Contactor Coil	Transformer Secondary
00	None	None
30	24 Volt	24 Volt
31	24 Volt	None
32	120 Volt	120 Volt
33	120 Volt	None
34	208/240 Volt	None
35	277 Volt	None

Code	Thermostat
00	None
40	300-049197-003
42	300-113075-003

Contactor		
Coil Voltage	30 Amp	50 Amp
24V	072-304551-001	072-304551-002
120V	072-304551-007	072-304551-008
208/240V	072-304551-013	072-304551-014
277V	072-304551-019	072-304551-020

Primary Voltage	Secondary Voltage	Transformer
208/240/480	24	315-304252-002
208/240/480	120	315-304252-001
277	24	315-304252-004
575	24	315-304252-005
277/575	120	315-304252-003

Limited Warranty:

Please refer to the Chromalox limited warranty applicable to this product at
<http://www.chromalox.com/customer-service/policies/termsofsale.aspx>.

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PRECISION HEAT AND CONTROL

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